**Remarks/Arguments**

Claims 6-8 and 10-15 are now pending in the application of which all currently stand rejected. Request for reconsideration is respectfully solicited based on the following remarks.

Claims 6-8 and 10-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over the alleged admitted prior art (APA) in view of Lee (US 6,214,751) (hereinafter "Lee 1") and Lee et al. (US 6,819,969) (hereinafter "Lee 2"). This rejection is respectfully traversed.

In particular, Applicant asserts that it would not have been obvious at the time of the invention to modify the APA using the teachings of Lee 1 and Lee 2, individually or in combination, to teach or suggest a plasma-enhanced method for processing a plurality of substrates that includes pre-creating a process atmosphere in a processing chamber, subsequently supplying the substrates in sequence into the chamber, processing a batch of the substrates [that includes] spraying a process gas into the chamber, and exciting the process gas using RF power to convert the process gas into plasma ... and after the chamber has been cleaned, and before any more substrates are loaded into the chamber, supplying the process gas into the chamber without exciting the process gas with RF power so as to reduce the temperature prevailing inside the chamber, as recited in independent claim 6.

The APA discloses a number of steps for a semiconductor integrated circuit fabrication process. As discussed in the APA, the fabrication processes can include a deposition step where a plasma-enhanced tetraethoxysilane (PE-TEOS) layer is deposited on a first batch of wafers using a radio frequency (RF) power source. See, e.g., pars. [0010-0045]. Next, a cleaning step (step 47) is applied to remove a TEOS layer inadvertently deposited on exposed portions of the inside of the processing chamber. See, par. [0050]. After the cleaning step,

a second batch of wafers is processed using the same RF-based PE-TEOS deposition process described above for the first batch of wafers. See, par. [0050].

As mentioned in the APA, the above-described process can cause the temperature of the inside of the chamber to rise in a manner that can inadvertently affect the deposition thickness of the PE-TEOS layer on the second batch of wafers. Accordingly, the APA does not teach a plasma enhanced deposition process having a post-cleaning step of subsequently supplying a process gas into a processing chamber without RF excitation, an issue made clear by the APA and admitted by the Office Action on page 3, section 9.

Similarly, the Office action concedes the same issue regarding Lee 1, i.e., that Lee 1 does not teach or suggest supplying a process gas into a chamber without exciting the process gas with RF power so as to reduce the temperature prevailing inside the chamber.

The Office Action then asserts on page 3 that Lee 2 "*shows supplying the process gas before and substrate being loaded*" without addressing the RF power issue, and without comment about whether Lee 2 is even capable of performing plasma-enhanced deposition (as required by claim 6) or whether the introduction of any deposition gas reduces the temperature prevailing inside its chamber (also required by claim 6).

The Office Action has not established a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, the prior art references must teach or suggest all the claim limitations, there must be some motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the reference teachings and there must be a reasonable likelihood of success to combine the references. See MPEP §2143, for example.

As mentioned above, the Office Action has not demonstrated that the

applied art of reference, individually or in combination, teaches or suggests all the elements of independent claim 6.

Further, the Office Action has not provided the required basis for the motivation to make the specific combination necessary under 35 U.S.C. §103(a).

While the Office Action states on page 3 that Lee 1 "is presented as evidence to show that in fact before any more substrates are loaded into the chamber the gas is not excited with RF power", Applicant respectfully points out that "the gas" mentioned by the Office Action is not a processing gas (e.g, TEOS) but a purging gas (e.g., nitrogen (see TABLE 2)). Applicant further points out that the purging gas is neither accompanied by a temperature drop (see, step 3 of TABLE 2) and in fact appears to be accompanied by a temperature rise from 0 degrees to 400 degrees (see, step 4 of TABLE 2). See also, col. 2, lines 13-14, col. 5, lines 28-29.

While the Office Action also asserts on page 4 that "it would have been obvious to a person of ordinary skill in the art ... to recognize that the process gas is not excited with RF power as suggested by Lee and Lee et al in order to provide the time for removing any unwanted cleaning material on the walls of the chamber and to prevent particles to be formed in the wafer", this assertion is problematic for a number of reasons.

First, the specific motivation cited by the Office Action (found in Lee 2 at col. 1, lines 12-18) is not any statement that would lead one of ordinary skill in the art to modify the APA to use the specific pre-coating step of Lee 2. Additionally, it is unclear why one would take any step of the apparently non-plasma-enhanced chemical vapor deposition (CVD) process of Lee 2 and apply it to the plasma enhanced chemical vapor deposition (PE-CVD) process of the APA.

Second, a careful reading of Lee 2 shows that the problematic particle

formation is caused by errant backflow of a deposition gas, not by RF excitation of the deposition gas. See, col. 2, lines 42-45. Accordingly, any specific motivation of Lee 2 to modify the APA would be at most a motivation to use Lee's "backflow preventing gas supply part" (labeled 62 in FIG. 2) or a specific switching valve (labeled 66 in FIG. 5) located outside a process chamber. See, col. 7, lines 23-31 and col. 8, lines 1-9.

Finally, it is unclear whether the plasma-enhanced process discussed in the APA suffers from particle formation on its wafers as the APA makes no mention of particle formation whatsoever. Accordingly, it makes little sense to try to cure a problem of the APA that does not appear to exist.

Thus, independent claim 6 defines patentable subject matter. Dependent claims 7-8 and 10-15 define patentable subject matter by virtue of their dependency as well as for the additional features they recite. Accordingly, withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

In the event that there are any outstanding matters remaining in the present application, please contact B. Y. Mathis (Reg. No. 44,907) at (571) 283-0720 in the Washington, D.C. area, to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment for any additional fees that may be required, or credit any overpayment, to Deposit Account No. 50-0238.

Respectfully submitted,
VOLENTINE FRANCOS & WHITT, PLLC

By: 

B. Y. Mathis
Reg. No. 44.907

VOLENTINE FRANCOS & WHITT, PLLC
One Freedom Square
11951 Freedom Drive, Suite 1260
Reston, VA 20190
(571)283-0720

Date: July 25, 2006